# 第２講　難関国公立大英語長文②

We often hear about the need to find (1)alternative energy sources in order to protect our planet from the harmful effects of climate change. Wind, wave and solar energy are all possible sources, but most of the electricity produced from non-fossil fuel sources comes from nuclear power. Nuclear energy may be ‘clean’, that is, it does not produce as much carbon dioxide or other greenhouse gases as fossil fuel energy plants, but it is not a permanent energy solution. Like coal and oil, the amount of uranium on earth is limited, and nuclear energy may only be a viable source of energy for the next 100 years. The effects of nuclear energy production, however, are more long-lasting, and potentially more problematic, than any damage that has resulted or could result from fossil fuel-induced climate change: even though building design and technology have improved, nuclear power plants are still susceptible to accidents that can damage whole regions, even countries; they also produce waste that remains harmful to the biosphere for centuries.

In its 57-year history, the nuclear energy industry has so far generated a minimum of 300,000 tons of high-level nuclear waste. In order to be safe, this waste must be kept away from living creatures for at least 100,000 years. How do we dispose of this material safely? An example from Finland demonstrates some of the problems we face. The Finnish government is currently building a deep geological repository, a 5km-long tunnel that winds its way down 400m into the bedrock to a network of storage vaults. The

location is called ‘Onkalo’. It will be ready to store waste in 2020, and then sealed in 2120. The Finnish government intends that Onkalo will remain closed for 100,000 years.

*NOTE*

That’s a difficult prospect for architects. How do you design something that’s meant to last for such a long time? In 100,000 years, there will be little or no trace of our present civilization. Some of the oldest buildings on earth, the Egyptian pyramids, have been around only for about 3,000 years. Onkalo presents a difficult conceptual problem for humans: anatomically modern humans have been in existence for around 200,000 years, but think how different the first humans would have been. How would you communicate with them? How could you make them understand the world in which you live? What will humans be like in 100,000 years?

Since the material to be stored is so dangerous, the designers of Onkalo — and all nuclear nations that must build these structures, at great expense — have to think about these issues. How can we prevent humans from trying to excavate the site in the future, causing massive damage to their species and their environment? The designers could leave a warning sign, something like ‘This is a very dangerous place. Stay away. Do not try to enter.’ But how can we communicate with humans so far in the future? Which language would we use? English? Chinese? It’s probable that neither of these languages will exist in the year 102012. Language itself might have become (ア)obsolete by that time. How about using a picture? If so, what would it be?

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Alternatively, should we not leave any markers about the site's dangers, and simply hope that Onkalo remains undiscovered? We must consider whether leaving a marker, even a warning, would make humans less or more curious to find out what's there. We can think about the pyramids again. It's clear that these were designed as burial structures, houses for the dead. They were not intended to be opened and explored, but (2)humans did so anyway. But even after around 200 years of excavation, our knowledge of the pyramids' purpose is still incomplete, as is our understanding of the Egyptian hieroglyphic system of writing. Humans are by nature (イ)inquisitive: if we see something we don't understand, we have a need to find out, even if our investigations are damaging towards ourselves and the environment. But (3)the destruction that could result if Onkalo were excavated in the future is much more extreme than simply rejecting the wishes of the dead or disrespecting their beliefs. In fact, if we don't think of the right ways to manage the problem, there may not be any humans in the future to judge whether what we did was right or wrong.

[2012 年度　北海道大学]

*NOTE*

問 1 下線部(1)は何に対する alternative を指していますか。文中から英語 2 語からなるフレーズを抜き出して答えなさい。

問 2 原子力発電の問題点を第一段落から 3 つ抜き出し，簡潔な日本語で述べなさい。

問 3 下線部(2)は具体的にどのような内容を指しているのか，以下の英文を完成させて答えなさい。

Humans ______________________________.

問 4 下線部(ア)と(イ)の英単語を置き換えるのに適切と考えられる別の英単語をそれぞれの選択肢(A)～(D)の中から 1 つずつ選び，記号で答えなさい。

（ア）obsolete:

（A）disused （B）diversified （C）standardized （D）visualized

（イ）inquisitive:

（A）cautious （B）curious （C）destructive （D）diligent

問５　下線部(3)を日本語に訳しなさい。

問６　この文章のタイトルとしてふさわしいものを次の(A)～(F)の中から２つ選び，記号で答えなさい。

(A) How We Can Prevent a Nuclear Plant Accident

(B) Learning from a Finnish Failure

(C) Managing the Nuclear Legacy

(D) Prospects of Post-Nuclear Energy Sources

(E) Will Nuclear Waste Outlive Us?

(F) The World in the Year 102012

# 第２講　　　　　　　　　　　　　　　　解答

＜解答＞

問１ fossil fuel

問２ （1）原子力の原料となるウラニウムが有限で，次の 100 年で枯渇する可能性があること。

（2）原子力発電所は広範囲に被害を及ぼしうる事故を起こす可能性があること。

（3）原子力発電所は，何世紀にもわたって生物圏に有害な廃棄物を生み出すこと。

問３ opened and explored the pyramids

問４ （ア）A　　（イ）B

問５ 全訳の下線部を参照。

問６ C, E

＜全訳＞

私たちは，気候変動の有害な影響から地球を守るために，代替エネルギー源を見つける必要性についてよく耳にする。風力，波，そして太陽光エネルギーはすべて可能性のあるエネルギー源だが，非化石燃料から作り出される電力のほとんどが，原子力から生まれるものだ。原子力は「クリーン」であるかもしれない，すなわち，それは化石燃料エネルギーの発電所ほど大量の二酸化炭素や他の温室効果ガスを出さないが，それは永久的なエネルギーの解決策ではない。石炭や石油のように，地球上のウラニウムの量は限られており，原子力は次の 100 年存続可能なエネルギー源にすぎないかもしれない。しかしながら，原子力エネルギーの生産の影響は，化石燃料に起因する気候変動から生じている，あるいは生じうるどんな被害よりも長引き，潜在的に問題が大きい可能性がある。建築設計や技術は向上したが，原子力発電所は依然として，地域全体，ひいては国全体にも被害を及ぼしうる事故につながりやすく，また何世紀にもわたって生物圏に害として残る廃棄物を生み出す。

その 57 年の歴史で，原子力産業は，これまでに最低でも 30 万トンの高濃度な核廃棄物を生み出してきた。安全性のために，この廃棄物は少なくとも 10 万年は生き物から隔離されていなければならない。私たちはどうやってこの物質を安全に廃棄できる

のだろうか。フィンランドの例が，私たちが直面する問題の一部を示してくれている。フィンランド政府は現在，地中深くにある保管場所を建設しており，それは地下貯蔵室のネットワークまで岩盤を 400 メートルらせん状に下る，全長 5 キロメートルに及ぶトンネルである。その場所は「オンカロ」と呼ばれている。そこでは，2020 年に廃棄物を収容できるようになり，その後，2120 年に封鎖される予定だ。フィンランド政府は，オンカロは 10 万年間封鎖しておく意向である。

それは建築家には難しい見通しである。どうやってそのような長期間もつように意図されたものを設計するだろうか。10 万年後には，私たちの現在の文明はほとんど，もしくは何の跡形もないだろう。地球上で最古の建築物の一部，例えばエジプトのピラミッドでも，ほんの 3000 年しか存在していない。オンカロは，人類にとって概念上難しい問題を提起している。解剖学的に言う現代人は，およそ 20 万年存在しているが，最初の人類がどれほど異なっていたか考えてみよう。どうやって彼らとコミュニケーションをとるだろうか。どうやって彼らに自分たちが暮らしている世界を理解させることができるだろうか。10 万年後に人類はどのようになっているだろうか。

収容する物質がとても危険なため，オンカロの設計者たち，そして多額の費用をかけてこれらの建造物を建設しなければいけないすべての原子力保有国は，これらの問題について考えなければいけない。どうすれば私たちは，人間が将来その場所を掘り返そうとして，人類とその環境に大損害を引き起こすことを防ぐことができるのか。設計者は，「これはとても危険な場所です。近寄らないでください。中に入ろうとしないでください。」のような警告の標識を残すことはできる。しかし，どうやって私たちはそんなにはるか先の人類とコミュニケーションをとれるのか。どの言語を私たちは使うのだろうか。英語か？　中国語か？　こういった言語のどちらも 102012 年には存在しない可能性がある。言語そのものが，その時までにすたれたものになっているかもしれない。絵を使うのはどうか。もしそうするなら，それはどのようなものになるだろうか。

あるいは，私たちはその場所の危険性について何も目印を残さずに，単に，オンカロがずっと発見されないことを願うべきなのか。私たちは，たとえ警告であっても，目印を残すことで，人間を多かれ少なかれそこに何があるかを知りたい気にさせるのかどうかを考慮しなければならない。再びピラミッドについて考えてみてはどうか。ピラミッドが埋葬用の建造物で，死者のための住処として設計されたのは明らかだ。それらは，あばかれたり，調査されたりするとは考えられていなかったが，それでも

人間はそうしてしまった。しかし，およそ200年にわたる発掘の後でさえ，ピラミッドの用途に対する私たちの知識はいまだに不完全で，それはエジプトの象形文字のしくみについての理解と同じようなものだ。人類は生まれつき好奇心の強いものだ。私たちは理解していないものを目にすると，たとえ私たちが調べることで，自分たちや環境に害を及ぼすことになっても，知ろうとするのだ。しかし，オンカロが将来発掘された場合に生じうる壊滅的状況は，単に死者の望みを拒否することや，その信条を軽んじることよりも，ずっと極めて厳しいものになる。事実，もし私たちがこの問題を処理する正しい方法を思いつかないなら，将来，私たちがやったことが正しかったのか間違っていたのかを判断する人間が一人もいないかもしれないのだ。

## 第２講　重要語彙リスト　　＊一つ一つ何度も繰り返して，覚えてください

| | | |
|---|---|---|
| 1 | alternative | 代わりの |
| 2 | nuclear | 原子の |
| 3 | carbon dioxide | 二酸化炭素 |
| 4 | greenhouse gases | 温室効果ガス |
| 5 | fossil fuel | 化石燃料 |
| 6 | permanent | 永久的な |
| 7 | viable | 存続可能な |
| 8 | long-lasting | 長く続く |
| 9 | potentially | 潜在的に |
| 10 | -induced | ～に起因する |
| 11 | be susceptible to | ～を受けやすい |
| 12 | biosphere | 生物圏 |
| 13 | minimum | 最低限 |
| 14 | nuclear waste | 核［放射性］廃棄物 |
| 15 | dispose of | 処理する |
| 16 | material | 物質 |
| 17 | demonstrate | 説明する |
| 18 | currently | 現在 |
| 19 | geological | 地質学の |
| 20 | repository | 保管場所 |
| 21 | wind one’s way | うねるように進む |
| 22 | bedrock | 岩床 |
| 23 | vault | 地下貯蔵室 |
| 24 | location | 場所 |
| 25 | seal | 密閉する |
| 26 | intend | 意図する |
| 27 | prospect | 見通し |
| 28 | architect | 建築家 |
| 29 | be meant to do | ～する意図だ |
| 30 | trace | 跡 |
| 31 | conceptual | 概念の |
| 32 | expense | 費用 |
| 33 | excavate | 発掘する |
| 34 | massive | 大量の |
| 35 | obsolete | すたれた |
| 36 | burial | 埋葬の |
| 37 | inquisitive | 好奇心のある |
| 38 | destruction | 破壊 |
| 39 | extreme | 極端な |
| 40 | disrespect | 軽視する |

## 第２講　音読用白文　①　②　③　④　⑤　⑥　⑦　⑧　⑨　⑩

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humans have been in existence for around 200,000 years, but think how different the first humans would have been. How would you communicate with them? How could you make them understand the world in which you live? What will humans be like in 100,000 years?

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